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REMARKS

Applicant appreciates the courtesies extended by Examiner Chang during the aforementioned May 31st telephone interview.

Claims 32-42 are pending, of which Claims 32 and 35-42 have been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,938,732 to Lim et al. ("Lim"). Claims 33-34 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of U.S. Patent No. 6,178,439 B1 to Feit ("Feit"). In addition, Claims 33-34 have been objected to for formal reasons. This application has been carefully considered in connection with the Examiner's Action and the subsequent interview with the Examiner, and Claims 32-34 have been amended into allowable form. These amendments have been made solely for the purpose of distinguishing Applicant's invention over the prior art cited by the Examiner, and were favorably discussed with the Examiner during the May 31 telephone interview. Reconsideration and allowance of the above-referenced application are respectfully requested in light of the foregoing amendments, the aforementioned May 31 telephone interview and the following remarks.

Claim 32 has been rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 5,938,732 to Lim et al ("Lim"). Specifically, independent Claim 32 is rejected as being anticipated by the recitation that "each host periodically sends a "control message" to all other hosts within the group" (col. 3, lines 30-37), that a "total host failure is detected if no heartbeat signal occurs within a timeout interval" (col. 8, lines 23-35) and that "each host within a service group periodically sends control (or info) messages to the service group via the service group address" (col. 5, lines 66-67 and col. 6, lines 1-6). In response, Applicant has amended independent Claim 32 such that it now further distinguishes and is patentable over the cited reference.

Specifically, independent Claim 32 has been amended to more particularly recite one of the distinguishing features of the present invention; namely, that the present invention allows the selected computer to send heartbeat messages *directly to one or more selected servers*. This is distinctive over the technique of Lim, which requires that "each member transmits messages to all other group members by addressing the message to the service group address, and each member

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receives messages from all other service group members by receiving messages destined to the service group address," (col 5, lines 21-29). In Applicant's invention, by contrast, the "client computer . . . is then expected to send periodic heartbeat messages (activateDTG messages) to the primary master DNS server" (page 12, line 28). Applicant's invention allows *direct transmission to the primary master DNS server* rather than Lim's broadcast *via a proxy address to all servers in the service group*.

This distinguishing characteristic, as discussed with the Examiner in greater detail during the May 31 telephone interview, provides Applicant's invention with numerous advantages not seen in the prior art. For example, Applicant's *direct transmission* to the primary master DNS server, rather than Lim's broadcast *via a proxy address* to all servers, eliminates the overhead of the step of converting the proxy address to the address of the intended recipient. This will yield a potential improvement in messaging process efficiency as a step of the messaging process is eliminated.

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claim 32. It is therefore submitted that Claim 32, as discussed with the Examiner during the May 31 telephone interview, clearly and precisely distinguishes over the cited art in a patentable sense and is therefore allowable over those references and the remaining references of record. Accordingly, in light of the amendments made solely to distinguish Applicant's invention from the prior art, it is respectfully requested that the rejection of Claim 32 under 35 U.S.C. § 102(e) as being anticipated by Lim be withdrawn.

Claims 35 and 36 have also been rejected under 35 U.S.C. § 102(e) as being anticipated by Lim. Specifically, the element in dependent Claims 35 and 36 of "generating a message by the selected computer in accordance with the heartbeat protocol to indicate unavailability of the one or more computer resources" is rejected as being anticipated by the recitation that "a total host failure is detected if no heartbeat signal occurs within a timeout interval." (col. 8, lines 26-35). As was discussed with the Examiner in greater detail during the May 31 telephone interview, insofar as they may be applied against the rejected claims, these rejections are respectfully traversed.

Applicant respectfully submits that the cited claim language refers to the recitation in the

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specification of "the client sends an explicit message (deactivateDTG) to tell the name server to change the state of the DTG to inactive," (page 16, lines 23-26) in the original application. This feature of Applicant's invention allows the *client* to *inform* the server of scheduled or expected periods of unavailability, *rather than waiting* for the *server* to *discover* unavailability from the lack of heartbeat messages. Lim does not teach, show, or suggest the presence of such a feature, and instead forces the *servers* receiving heartbeat messages to *discover* unavailability through the lack of heartbeat messages. This deficiency in the teaching of Lim will necessarily result in periods of unavailability prior to discovery and is corrected by Applicant's invention. In offering this additional feature of network availability prediction, which is not taught, shown or suggested in Lim, Applicant's invention offers a great advantage over the prior art.

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claims 35-36. It is therefore submitted that Claims 35-36 clearly and precisely distinguish over the cited art in a patentable sense and are therefore allowable over those references and the remaining references of record. Accordingly, as was discussed in the May 31 telephone interview, it is respectfully requested that the rejection of Claims 35-36 under 35 U.S.C. § 102(e) as being anticipated by Lim be withdrawn.

Claim 37 has also been rejected under 35 U.S.C. § 102(e) as being anticipated by Lim. Specifically, the element in independent Claim 37 of "providing a response to a message query for the computer resources for which the heartbeat is absent that the computer resources are unavailable" is rejected as being anticipated by the recitation that "Failure detection, also available to be performed by the present invention, involves monitoring of the 'info' or control messages sent by each host." (col. 8, lines 26-35). Likewise, the element in independent Claim 37 of "determining from the presence or absence of the heartbeat messages that all computer resources are available or unavailable" is rejected as being anticipated by the same recitation. As was discussed with the Examiner in greater detail during the May 31 telephone interview, insofar as they may be applied against the rejected claims, these rejections are respectfully traversed.

Even if the cited elements could reasonably be inferred from the cited language, which

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Applicant respectfully contests, Applicant respectfully notes that "providing a response to a message query for the computer resources for which the heartbeat is absent that the computer resources are unavailable," neither occurs nor is suggested anywhere within the cited language, or elsewhere in Lim. More specifically, Lim teaches away from this feature, specifying that "*each* member transmits *messages to all* other group members by addressing the message to the service group address, and each member receives messages from all other service group members by receiving messages destined to the service group address," (col 5, lines 21-29).

Lim fails to teach, show or imply the cited feature, because the use of a server to answer queries regarding the availability of resources is incompatible with Lim's system, which is designed to automatically, and without querying, distribute information on availability from any client to all other group members by addressing the message to the service group address. Applicant's invention provides a system where those machines needing information on the availability of a particular resource may query the resource, whereas Lim specifies a system where this information is processed by each potential recipient without regard to whether it is required.

This distinguishing characteristic provides Applicant's invention with numerous advantages not seen in the prior art. An example of the improved efficiency of Applicant's response of a server to queries, rather than Lim's broadcast *to all servers*, arises from the elimination of unnecessary broadcast to computing machines that do not need to receive the heartbeat message. Lim's strategy results in messages being constantly sent to machines that do not need to receive them, needlessly increasing traffic on the network. In Applicant's invention, by contrast, messages are sent only to "the primary master DNS server" (page 12, line 28), which can then answer queries. Applicant's invention reduces the overhead of needless transmission.

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claim 37. It is therefore submitted that Claim 37 clearly and precisely distinguishes over the cited combinations in a patentable sense and is therefore allowable over those references and the remaining references of record. Accordingly, as was discussed in the May 31 telephone interview, it is respectfully requested that the rejection of Claim 37 under 35 U.S.C. § 102(e) as being anticipated

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by Lim be withdrawn.

Claims 38-40 have also been rejected under 35 U.S.C. § 102(e) as being anticipated by Lim. Specifically, the element in dependent Claim 38 of "providing additional information associated with the response to the message query concerning the computer resources" is rejected as being anticipated by col. 5, lines 7-15 of Lim. Likewise, elements in dependent Claims 39-40 are rejected as being anticipated by the same recitation. As was discussed with the Examiner in greater detail during the May 31 telephone interview, insofar as they may be applied against the rejected claims, these rejections are respectfully traversed.

Applicant respectfully notes that "providing additional information associated with the response to the message query concerning the computer resources" neither occurs nor is suggested anywhere within the cited language, or elsewhere in Lim. The distinction between Applicant's invention and Lim on the basis of the use of querying techniques is discussed in detail above.

Claims 39-40 are rejected on the basis of similar arguments to those used against Claim 38. Claim 40 depends from and further limits Claim 38 in a patentable sense and, for this reason, and the reasons set forth above, is also deemed to be in condition for allowance. Claim 39 mirrors Claim 38, with the only difference being that, instead of "providing additional information associated with the message query concerning the computer resources," it recites "providing additional information associated with the message query concerning when the resource is expected to become available." For the reasons argued above with respect to Claim 38, Lim also teaches away from "providing additional information associated with the message query concerning when the resource is expected to become available."

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claims 38-40. It is therefore submitted that Claims 38-40 clearly and precisely distinguish over the cited combinations in a patentable sense and are therefore allowable over those references and the remaining references of record. Accordingly, as was discussed with the Examiner in greater detail during the May 31 telephone interview, it is respectfully requested that the rejection of Claims 38-40 under 35 U.S.C. § 102(e) as being anticipated by Lim be withdrawn.

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Claims 41-42 depend from and further limit Claim 37 in a patentable sense and, for this reason and the reasons set forth above, are also deemed to be in condition for allowance. Accordingly, it is respectfully requested that the rejections of dependent Claims 41-42 be withdrawn, as well.

Claim 33 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of U.S. Patent No. 6,178,439 B1 to Feit ("Feit"). Specifically, the element in dependent Claim 33 of the single selected (client) machine "requesting a new heartbeat rate" is rejected as being obvious in view of the teaching in 35 lines of Feit of "the single selected computer requesting a new heartbeat rate, and upon agreement by the server to the new heartbeat, implementing the new heartbeat," for which the examiner cites col. 6, lines 44-67, col. 7, lines 55-65; and col. 8, lines 7-9. As was discussed with the Examiner in greater detail during the May 31 telephone interview, insofar as it may be applied against the rejected claims, this rejection is respectfully traversed.

Examiner has characterized the cited passage in Feit as teaching "the single selected computer requesting a new heartbeat rate, and upon agreement by the server to the new heartbeat, implementing the new heartbeat." Applicant respectfully submits that "the single selected computer requesting a new heartbeat rate, and upon agreement by the server to the new heartbeat, implementing the new heartbeat" neither occurs nor is suggested anywhere within the cited language or elsewhere in Feit. Applicant respectfully submits that Feit, especially in the cited passages, teaches away from Applicant's invention.

More specifically, Feit describes a web *server* sending a web page to a client, wherein "the *page includes* the scripting language function that will produce the later beats," (col. 5, lines 60-62). Once the client receives this page, the script activates, and "[F]ollowing the first time interval X_0 , at which the first beat is sent to the server, the page waits another time interval the (X_1), and sends the second beat to the server," (col 6, lines 7-9). In the language specifically cited by the Examiner for this function, the times of the intervals are different for later beats (col. 6, lines 45-46). This function, however, is *controlled by the server* in the sending of the original script that is contained in the original web page, and teaches away from Applicant's invention, which allows the *single selected (analogous to client) computer to control* the timing of heartbeat messages by "the single

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selected (*analogous to client*) computer *requesting* a new heartbeat rate.” Applicant respectfully submits that Feit does not render Applicant’s invention obvious because Feit’s system of *server-based control* teaches away from and directly conflicts with Applicant’s system of *client-based control*.

This distinguishing characteristic of control by the single selected computer provides Applicant’s invention with numerous advantages not seen in the prior art’s recitation of server-based control. In particular, the Applicant’s invention allows requests for changes to the heartbeat rate to be initiated by the single selected computer at the periphery of the network, where accurate information concerning conditions with the potential to impact connectivity of the single selected computer is most likely to be available. In the cited art, by contrast, the heartbeat rate is determined at the center of the network, based on (what is probably) less reliable information about connectivity.

A person skilled in the relevant art would not have arrived at Applicant’s invention based on the teachings of Feit. A person skilled in the art, in attempting to employ the teachings of Feit, would have arrived at an inferior and defective solution, which would have changed heartbeat rate based upon server control.

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claim 33. It is therefore submitted that Claim 33 clearly and precisely distinguishes over the cited combinations in a patentable sense and is therefore allowable over those references and the remaining references of record. Accordingly, as was discussed with the Examiner in greater detail during the May 31 telephone interview, it is respectfully requested that the rejection of Claim 33 under 35 U.S.C. § 103(a) as being rendered obvious by Lim in view of Feit be withdrawn.

Claim 34 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Lim in view of Feit. Specifically, the element in dependent Claim 34 of “the server imposing at any time a minimum heartbeat period” is rejected as being obvious in view of the alleged teaching in Feit of “server imposing at any time a minimum heartbeat period on the selected computer,” for which the Examiner cites col. 7, lines 59-65. Insofar as it may be applied against the rejected claims, this rejection is respectfully traversed.

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Examiner has characterized the cited passage in Feit as teaching "server imposing at any time a minimum heartbeat period on the selected computer." Applicant respectfully submits that "server imposing at any time a minimum heartbeat period on the selected computer" neither occurs nor is suggested anywhere within the cited language or elsewhere in Feit. Applicant respectfully submits that Feit, especially in the cited passages, teaches away from Applicant's invention.

More specifically, Feit describes a web *server* sending a web page to a client, wherein "the *page includes* the scripting language function that will produce the later beats," (col. 5, lines 60-62). Once the client receives this page, the script activates, and "[F]ollowing the first time interval X_0 , at which the first beat is sent to the server, the page waits another time interval the (X_1), and sends the second beat to the server" (col. 6, lines 7-9). This function, however, *is dictated by the content of the original script at the time of original transmission* and teaches away from Applicant's invention, which allows the server to impose the new minimum heartbeat period *at any time, through an additional transmission to the client*. Applicant respectfully submits that Feit does not render Applicant's invention obvious, because Feit's system of *control based on the content of original transmission* teaches away from and directly conflicts with Applicant's system of *control based on additional transmission*.

In view of the foregoing, it is apparent that none of the cited references, either singularly or in any combination, teach, suggest or render obvious the unique combination now recited in Claim 34. It is therefore submitted that Claim 34 clearly and precisely distinguishes over the cited combinations in a patentable sense and is therefore allowable over those references and the remaining references of record. Accordingly, as was discussed with the Examiner in greater detail during the May 31 telephone interview, it is respectfully requested that the rejection of Claim 34 under 35 U.S.C. § 103(a) as being rendered obvious by Lim in view of Feit be withdrawn.

Applicant notes with appreciation the Examiner's reminder that care should be taken to include proper antecedent basis in the claims in order to conform the claims to the requirements of 35 U.S.C. § 112. Applicant has complied with this reminder by amending Claims 32 and 33 to include proper antecedent basis.

Applicant notes with appreciation the Examiner's reminder that care should be taken to

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include clear and specific claims in order to conform the claims to the requirements of 35 U.S.C. § 112. Applicant has complied with this reminder by amending Claims 32-34 to clearly identify the elements discussed.

Applicant does not believe any fees are due in connection with the filing of this paper; however, in the event any fees are due, the Commissioner is hereby authorized to charge any required fees due (other than issue fees), and to credit any overpayment made, in connection with the filing of this paper to Deposit Account No. 50-0605 of Carr Law Firm, L.L.P.

Applicant has now made an earnest attempt to place this application in condition for allowance. Therefore, Applicant respectfully requests, for the reasons set forth herein and for other reasons clearly apparent, full allowance of Claims 32-42.

Should the Examiner have any questions or desire clarification of any sort, or deem that any further amendment is desirable to place this application in condition for allowance, the Examiner is invited to telephone the undersigned at the number listed below.

Respectfully submitted,

Dated: 6/17/02

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AMENDMENT

VERSION WITH MARKINGS TO SHOW CHANGES MADE

32. (AMENDED) A method for implementing a heartbeat protocol, comprising: ~~generating~~ sending, directly to one or more selected servers, heartbeat messages by from a single selected computer, indicating the availability of computer resources on one or more computers, such that loss of heartbeat messages from the selected computer is indicative that all computer resources on the one or more computers are unavailable, and the presence of a heartbeat from the selected ~~machine~~ computer is indicative that all computer resources are available.

33. (AMENDED) The method of Claim 32 further comprising the step of the single selected computer requesting a new heartbeat rate, and upon agreement by the one or more selected servers to the new heartbeat, implementing the new heartbeat rate.

34. (AMENDED) The method of Claim 32 further comprising the step of the one or more selected servers imposing at any time a minimum heartbeat period on the selected computer.